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A PILOT STUDY COMPARING THE BLOCK SYSTEM AND THE INTERMITTENT SYSTEM OF SCHEDULING SPEECH CORRECTION CASES IN THE PUBLIC SCHOOLS.

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DESCRIPTORS- *EXCEPTIONAL CHILD RESEARCH, *SPEECH HANDICAPPED, *SPEECH THERAPY, *TEACHING METHODS, SPEECH IMPROVEMENT, SPEECH INSTRUCTION, SPEECH THERAPISTS, ARTICULATION (SPEECH), PROGRAM EFFECTIVENESS, PROGRAM EVALUATION, TIME BLOCKS, SCHOOL SERVICES, SCHEDULING, PILOT PROJECTS, TEMPLIN DARLEY ARTICULATION TEST, ILLINOIS TYPOLOGICAL RATING SCALE,

TO DETERMINE THE MOST EFFICIENT USES OF THE PUBLIC SCHOOL SPEECH CORRECTIONIST'S SKILLS AND TIME, A STUDY WAS UNDERTAKEN TO INVESTIGATE THE EFFECTIVENESS OF THE INTERMITTENT SYSTEM AND THE BLOCK SYSTEM OF SCHEDULING SPEECH CASES. WITH THE INTERMITTENT SYSTEM THE CORRECTIONIST IS ASSIGNED TO A NUMBER OF SCHOOLS AND GENERALLY SEES CHILDREN TWICE A WEEK FOR 15 TO 20 MINUTES. UNDER THE BLOCK SYSTEM CHILDREN RECEIVE DAILY THERAPY FOR 3 TO 6 WEEKS, AND 1 DAY A WEEK THE CORRECTIONIST RETURNS TO ALTERNATE SCHOOLS FOR CARRYOVER OR SEVERE SPEECH CASES. THE STUDY HYPOTHESIZED THAT ARTICULATION PROBLEMS WOULD SHOW GREATER IMPROVEMENT WITH THE BLOCK SYSTEM, AND THAT WHEN ARTICULATION PROBLEMS WERE VIEWED IN TERMS OF FOUR SEVERITY GROUPINGS THE BLOCK SYSTEM WOULD MAKE GREATER GAINS. TWO CORRECTIONISTS USED THE BLOCK SYSTEM IN FIVE CHAMPAIGN (ILLINOIS) PUBLIC ELEMENTARY SCHOOLS WITH 153 CHILDREN, WHILE FOUR CORRECTIONISTS USED THE INTERMITTENT SYSTEM IN 13 SCHOOLS WITH 243 CHILDREN. NONE OF THE CHILDREN WERE IN ORTHOPEDIC OR MENTALLY RETARDED CLASSES. THE TEMPLIN-DARLEY ARTICULATION TEST WAS ADMINISTERED AT THE OPENING AND CLOSE OF THE SCHOOL YEAR, AND THE ILLINOIS TYPOLOGICAL RATING SCALE WITH SEVERITY RATINGS FROM ONE TO FOUR WAS APPLIED. WHEN THE TWO TOTAL GROUPS WERE COMPARED, SPEECH GAINS OF BLOCK SYSTEM CHILDREN WERE CONSISTENTLY AND SIGNIFICANTLY GREATER THAN THOSE OF THE CHILDREN ON THE INTERMITTENT SYSTEM (.01 LEVEL OF CONFIDENCE). OF THE FOUR SEVERITY GROUPINGS, ONE BLOCK SYSTEM GROUP, THE SECOND MOST SEVERE, MADE SPEECH GAINS OF STATISTICAL SIGNIFICANCE (.01 LEVEL). SCHOOL PRINCIPALS AND MOST TEACHERS WHO EXPERIENCED BOTH SYSTEMS PREFERRED THE BLOCK SYSTEM. SIX TABLES, FIVE REFERENCES, AND AN APPENDED SCORE SHEET ARE PROVIDED. (GD)

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and
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Champaign Community Unit 4 Schools
Department of Special Services
E. H. MELLON, Superintendent
Champaign, Illinois
May, 1963

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We are particularly appreciative of the encouragement for and the approval of this project by the State Consultants on Speech Correction, Miss Martha Black and Mr. Milton Eastman. Without their suggestions and approval, this project would not have been initiated.

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FOREWORD

The acquisition of verbal communication skills is paramount in fostering the development of other skills which are important to the total adjustment and optimum development of an individual. As our society has become more verbally oriented, greater emphasis has been placed on helping each individual speak as effectively as possible. Regardless of abilities, talents, and accomplishments, an individual's personal worth and contributions may, justly or unjustly, be evaluated in large part on how well he presents himself verbally.

Approximately 10 to 15 per cent of school age children have speech defects, ranging from mild to severe, that warrant special attention. Even slight defects in speech may have a marked effect on the personality of an individual. He may develop feelings of inferiority and inadequacy which in turn may undermine his self-confidence. Such feelings may make him fearful of putting forth his best efforts in academic situations as well as in interpersonal relationships.

Recognizing the need for alleviating speech problems among school age children, public schools have employed speech correctionists to identify and provide services for the speech defective. The number of such specialized personnel on the staff of public schools has increased markedly during the last ten years. Although the number of children in public schools who are now receiving speech therapy is much larger than the total number of speech defectives seen by speech clinics, relatively little research in this specialized area is being conducted in the public schools. Most of the research is being conducted by university personnel. As stated by Van Hattum, 'Research in the public school holds the most exciting challenge in the speech and hearing field today. Accepting this

challenge can result in more benefits for more children than any other area this profession can offer".

The Supervisor of Speech and Hearing, John B. Weaver, is to be commended for his sensitivity to and sincere interest in identifying problems in the area of speech correction that should be studied in the school setting.

The research skill and the understanding of learning theory and personality development that Mrs. Janet Wollersheim, School Psychologist, contributed to this research project were invaluable.

This pilot study hopefully represents the first of a series of studies to be conducted in the Champaign Schools by its staff members. New knowledge obtained from this study and subsequent studies are needed to serve as a guide for improving public school speech correction. The supervisor, school psychologist, speech correctionists, regular teachers and administrators are to be commended for the high order of cooperation that prevailed throughout the study. This study not only obtained answers to some crucial questions regarding the effectiveness and efficiency of two organizational plans of scheduling speech correction, but in addition there is reason to believe that the personnel who engaged in this study made professional growth. Research is a valuable method of in-service education and should be used more frequently in the public schools.

Merle B. Karnes
Director of Special Services

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Chapter I

INTRODUCTION

Problem

As the field of speech pathology has grown and the values of providing speech correction to school age children have become more widely recognized, there has been a consistent increase in the number of speech correctionists employed in the public schools. School systems which have not previously provided speech services have been motivated to initiate speech correction programs. To complete the cycle, we find that colleges and universities throughout the country have responded to the demand for more persons qualified in this field and are attempting to supply such personnel by expanding their educational programs in speech correction.

The pioneers in local and state speech correction programs should indeed be proud of what is obviously a valuable service to the public schools and to the children who are speech defective. There is, however, a need to evaluate organizational aspects of public school speech correction programs. The agreement on the need for such evaluation is found consistently when public school speech correction is discussed by university personnel, clinic directors, administrators in special education, and most significantly by the speech correctionists who are working in the public schools.

In evaluating public school speech correction programs, Van Riper (1) in 1955 said that "Although the administration of public school speech therapy varies widely in different sections of this country, there are certain features which are commonly found. These can be stated as follows:

1. Most speech therapy is administered to groups of children with little provision for individual therapy except in a few cases.
2. The majority of the case load consists of articulation cases whose defective sounds are few in number.
3. The most characteristic errors are those which the normal speaking child last acquires in the course of his speech development.
4. The case loads are generally excessive for most efficient speech therapy.
5. Scheduling difficulties coupled with the excessive case load prevent the therapist from helping those children who need him most, those with emotional problems requiring longer periods and more individual attention.
6. Even a slight improvement in the conditions under which the speech therapist operates should do much to solve this problem and reduce case loads to more favorable numbers."

In view of the above statements by Van Riper and in consideration of similar evaluations of public school speech correction programs by other authorities in the field of speech correction, this study was proposed to investigate the effectiveness of the intermittent system and the block system of scheduling speech cases in the public schools.

One of the purposes of the efficient use of time is to bring about greater effectiveness of overall operation. The most efficient use of the speech correctionist's time, therefore, is obtained when the speech correctionist can work on a schedule that will allow his

skills to be used with greater effectiveness. From the viewpoint of speech therapy, effectiveness may be determined by the degree of improvement in speech attained by children receiving speech services. By evaluating the comparative effectiveness of speech therapy scheduled under the intermittent and block systems, this study lends information concerning the more efficient use of the speech correctionist's skills and time. The design of the present study is such that a speech correctionist will serve the same number of children during an academic year regardless of whether the speech correctionist is working under the intermittent or block system. If greater effectiveness in terms of improvement of speech is associated with one system of scheduling as opposed to the other system, it follows that the system associated with greater speech progress is the more efficient system. The results of this study should be helpful to public school systems offering speech correction services and to university personnel responsible for training speech correctionists. This study is further viewed as an investigation which should be helpful to school personnel in evaluating their current programs and in planning future programs.

Before discussing the relative merits of scheduling speech correction services by the intermittent or block system, some explanation of the operational procedures of the two systems is warranted.

Description of the Intermittent System

The intermittent system of scheduling speech correction services in the public schools is the system most generally used throughout the country. The speech correctionist working under this system is assigned a number of schools. Customarily the assigned schools receive speech

correction services at least twice a week. Under this organizational plan, the speech correctionist sees the children twice a week for a period of fifteen to twenty minutes.

For purposes of clarification let us assume a speech correctionist has been assigned to schools A, B and C. Upon completing his speech screening, he has found that school A will have the heaviest case load of the three assigned schools. School B will have a medium case load and school C will have the lightest case load. The speech correctionist would probably schedule school A for speech correction services two days a week, school B for one and one-half days, and school C for two half-days. The remaining half-day would be devoted to office work and parent conferences. The weekly schedule would be as follows:

Monday all day and Wednesday all day..... school A

Tuesday A.M. and Thursday all day..... school B

Tuesday P.M. and Friday A.M..... school C

Friday P.M..... office

Description of the Block System

The block system of scheduling speech correction services in the public schools is a less frequently used system. Under the block system the speech correctionist constructs his schedule in blocks of time. Depending on the working block, he spends a block of time ranging from three full weeks to six full weeks in an assigned school. Four days of the week he works with the speech cases in the assigned school or schools and the fifth day is utilized in the school or schools assigned the alternate block. At the end of the working block he schedules himself in his alternate school or schools to provide speech therapy for four days a week while using his fifth day

to return to the schools he served on the previous block. By so doing, the fifth day can then be devoted to providing speech correction for those children whom the speech correctionist feels can most benefit from the extra help. As long as the fifth day remains flexible the speech correctionist makes the final decision as to how it is to be best utilized. While the most severe speech cases may warrant the extra work in one situation, the carry-over speech cases may warrant the extra work in a different situation. Time is allotted between blocks for record keeping, conferences, and home calls.

If the speech correctionist on the block system were assigned the same schools as the speech correctionist on the intermittent system, the schedule would be as follows (assuming a five week block which would provide 6 working blocks for the school year):

Blocks 1, 3, 5.....four days a week..... school A

fifth day of each week ..... school B 3/4

..... school C 1/4

Blocks 2, 4, 6.... four days a week ..... school B 3/4

..... school C 1/4

fifth day of each week ..... school A

Review of Related Research

Upon examining the operational procedures of the intermittent system it appears that the number of cases required by the various state standards is a greater variable than the number of organizational plans used in scheduling children for speech. The intermittent system is the most frequently used approach in scheduling children for speech services in the public schools. The greatest consistency in this approach seems to be that the children are scheduled for speech therapy

intermittently over a period of time. Case load requirements differ significantly from area to area. The amount of individual work, group work, and the number of lessons per week also differ. The minimum and maximum case load requirements vary and tend to be excessive. More often than not such case load requirements demand that the speech correctionist expend greater energy in determining when and how he will see the number of children required, rather than in determining the most beneficial approach to individual speech problems.

Van Hattum (2) notes that the dismissal rates of children receiving speech correction tend to improve when the block system of scheduling is used as contrasted with the intermittent system. Comparing the use of these different methods of scheduling for one year periods, he notes that the dismissal rate was 19% and 20% under the intermittent system and 35% and 40% under the block system. Van Hattum acknowledges that this information is open to criticism since it was not statistically validated nor were the data obtained as a result of a formally designed research project. This information concerning dismissal rates certainly warrants further consideration of the possible advantages of the block system by public school personnel.

Further encouragement for investigating the merits of the block system comes from information released by Van Riper (1). He found that dismissal rates for the commonly used intermittent system ranged from 11% to 21%, while under the block system 38% of the cases no longer required speech correction at mid-term and by May the total dismissal rate was increased to 51%.

These two investigations directed concern to the dismissal rates using the varying systems of scheduling speech cases in the public schools. Some attention was also focused on the percentage of speech cases which indicated improvement under each system of scheduling. There was, however, no indication of the severity of the speech problems exhibited by the subjects nor was the amount of speech gain indicated. While information relating to dismissal and improvement favored the block system, estimation of the severity of the speech problem treated and measurement of the degree of improvement would permit a more thorough evaluation of the block and the intermittent system. It is agreed that the primary goal of speech therapy in any setting is the eventual dismissal of the client from therapy. Yet measurement of speech progress realized in therapy is also of major concern. Using a consistent yardstick to determine the severity of the speech problem and then classifying severity in terms of a typological rating system would help delineate the specific amount of speech progress attained under each system. Utilization of such a procedure before and after therapy establishes categories of severity. The speech progress associated with speech therapy within the various typological classifications can then be specifically measured. Such a process allows a more thorough and specific evaluation of the gains made through speech therapy and the effectiveness of different approaches to the scheduling of speech cases.

Chapter II

THEORETICAL ORIENTATION AND HYPOTHESES

The experimental variable manipulated in this research is the scheduling of speech therapy according to either the intermittent or block system. It is hypothesized that articulation problems indicate greater improvement if speech therapy is administered through a block system approach to scheduling. The rationale for this hypothesis is based upon the viewpoint that many factors related to speech therapy and speech progress vary in their manner of operation when therapy is administered under the block system as contrasted with the intermittent system. It is contended that these changes are such that they are conducive to more effective progress in speech.

The block system approach used in this study emphasizes a smaller case load for blocks of time. The number of children, however, seen during the academic year is essentially the same as the number of children seen by the speech correctionist under the intermittent system. Seemingly, a smaller case load allows the speech correctionist to use a more clinical approach with the children he serves. Since he is working with fewer children at any one particular time, he has more opportunity to investigate and to understand the speech problems of the child. The therapist can then more effectively plan his method of therapeutic approach. Under the block system the speech correctionist serves approximately one-half as many children as he does under the intermittent system at any one particular time.

It appears plausible that in many instances the personal motivation and enthusiasm of the therapist for his work improves when he feels that he can devote major concern to individual speech problems. The extent to which this is realized is enhanced by the block system where

the therapist is responsible for fewer cases. Indeed, an often encountered objection of speech correctionists working under the intermittent system is that they feel the emphasis placed upon the large number of children scheduled imposes limitations upon the services they are able to offer these children. The most often suggested solution to this problem is a reduction of the speech correctionist's case load. This study does not attempt to evaluate how much speech gain can be attributed to the lone factor of smaller case load. It is contended, however, that the reduced case load of the block system is one of the variables that may contribute to more effective therapeutic results.

Another feature of the block system is that for various periods of time the speech correctionist sees each child more frequently than he would if the intermittent schedule were in operation. Seeing the child four days a week for a block of time would seem to be conducive toward promoting a closer working relationship between speech correctionist and child. The importance of the therapeutic relationship cannot be overlooked as a significant factor associated with progress in speech. A number of other advantages would appear to be associated with the child's receiving speech services four times a week. The speech therapist is in a better position to consistently check and evaluate the child's progress. It would seem that the child himself might better recognize the value of speech and be better motivated to concentrate more effort in this area. Then, too, it seems likely that the child may find it easier to remember his speech assignments when he sees the speech correctionist daily. Knowing that the speech correctionist will be checking upon him frequently, the child may give

more consideration to the carry-over of his improved speech and regression between lessons may be reduced. Likewise, with the child receiving speech services daily, the classroom teacher may become more aware of the child's speech difficulties and be more consistent in reinforcing improved speech. These factors all of which are associated with seeing a child more frequently for concentrated periods of time would seem to be related to more positive therapeutic results.

It appears that quite probably under a block system of scheduling where case load is reduced and where the child is seen more frequently, the early dismissal of cases evidencing milder speech problems would be greater than under the intermittent system. This would give the speech correctionist a greater portion of the academic year to work intensively with more severe cases.

All of the factors discussed thus far would seem to operate toward more effective speech progress when therapy is scheduled under a block system rather than under an intermittent system. It is very likely that some factors such as that of reduced case load may contribute more significantly to speech gains than other factors. Nevertheless, it is not the purpose of this study to evaluate the relative strengths of these different factors in their overall contribution to gains in speech progress. The contention of this research is that these factors operate more effectively toward bringing about gains in speech therapy when the block system of scheduling is used as contrasted with the intermittent system. When these two systems of scheduling are contrasted, differences between them become apparent. Many of these differences cannot be realistically perceived as differences in scheduling alone. For example, under the block system,

because the speech correctionist is working with fewer children at any one particular time, more children may receive individual speech therapy than would be the case under the intermittent system. This difference does not directly stem from the scheduling difference between the two systems. Yet it seems very likely that differences such as these arise because the block system of scheduling allows such differences greater freedom to operate than does the intermittent system. Seemingly by manipulating the experimental variable of scheduling, more factors conducive to greater speech progress are allowed to operate on the block system than on the intermittent system.

With this theoretical orientation, the hypotheses are:

1. Children with articulation problems receiving speech correction under the block system of scheduling make significantly greater gains in speech than a contrast group of children receiving speech correction under the intermittent system of scheduling.

2. When articulation problems are viewed as four severity groupings, children receiving speech correction under the block system make significantly greater gains in speech in each of the four groupings than will children receiving speech correction under the intermittent system of scheduling.

In addition to advantages related to speech progress, the block system of scheduling would seem to have other merits when contrasted to the intermittent system. It would seem that working conditions are more favorable when the speech correctionist is working under a block system since less time is used in traveling to and from different schools. Because he is concentrating blocks of time in one school, he

seemingly has a better opportunity to become a more integral part of the school faculty in which he is working. This may be associated with more favorable relationships between the speech correctionist and the regular classroom teachers. Then, too, by being scheduled four times a week in the same school, the speech correctionist may find that children better remember their speech appointments. Hence, time that would ordinarily be wasted in going to and from classrooms to remind children of their appointments is saved.

If any change is to be successful in the public schools it is important that teachers and principals react favorably to the change and perceive it as being worthwhile. Therefore, this study also attempts to obtain some index of the degree to which the block system of scheduling speech services is accepted by school personnel. While the obtaining of such information is not the main objective of this study, it is of significance since the effectiveness of any program is influenced by the degree to which such a program is perceived and accepted.

Chapter III

METHOD

Selection of Subjects

Six speech correctionists employed in the Champaign Community Schools administered speech screening tests at the beginning of the school term. On the basis of the results of the speech screening tests and factors common to public school speech correction (time, number of schools assigned, case load), the speech correctionists selected the children who would comprise their initial speech case load. The experimental group was selected from a school population of 1,700 enrolled in five of the eighteen elementary schools. These five schools were served by two speech correctionists. The contrast group was selected from a school population of 3,400 enrolled in the remaining thirteen elementary schools. These thirteen schools were served by four speech correctionists using the intermittent system. In both the experimental and contrast groups there were approximately comparable proportions of rural, negro, and upper, middle and lower class white children.

General Procedure for Gathering Data

All children scheduled for speech correction services who exhibited articulation difficulties on screening tests were administered a full scale Templin-Darley Articulation Test (3) prior to receiving speech therapy. Cases which did not meet the criteria of the research design were not included in the study. That is, articulation cases that also presented vocal problems or rhythmical speech problems were eliminated from the investigation although they continued to receive speech services. Also, children who were in special orthopedic classes or

classes for the mentally handicapped were not included as subjects for this study. The results of the screening process, then, provided an N of 153 on the block system and 243 on the intermittent system.

Additional information was gathered in regard to group IQ scores, grade placement, age, sex, and previous years of speech therapy. The group IQ scores used were total IQ scores from the California Test of Mental Maturity. This instrument is administered by the school system to all children when they are in the first, third, and fifth grades. In all instances the child's most recent IQ score was used. The grade in school in which the child was enrolled at the beginning of the school year was used in determining grade placement. The age index utilized was the child's age in years at the beginning of the study. Years of previous speech therapy was obtained from the information available in the child's individual cumulative folder and/or from his record located in the files of the speech department.

At the end of the school year all children who were receiving speech services were again administered a full-scale Templin-Darley Articulation Test. Children who had been dismissed from speech services earlier in the year were administered the test at the time of dismissal. Children were assigned to one of four classifications indicating severity of articulation problem. These classifications were obtained by following a typological rating system developed at the University of Illinois (4). This rating system utilizes scores from the Templin-Darley test as well as other measurements. The typological classification is based on an articulation severity scale ranging from 1 to 4. The typological classification of 1 is considered to be the least severe and the typological classification of 4 the most

severe. Under the block system eleven children were classified as type 1, thirty-four as type 2, seventy-nine as type 3, and twenty-nine as type 4. The intermittent system consisted of fifty-two children designated as type 1, seventy-three as type 2, eighty as type 3, and thirty-eight as type 4.

Characteristics of the Subjects

Table 1 presents the variables of age, grade placement, IQ, and previous years of therapy for the total group receiving speech therapy under the block system and the total group receiving speech therapy under the intermittent system. All comparisons were made by using two-tailed t tests since no predictions were made concerning these variables. As indicated in Table 1, there was no significant difference between the two groups in terms of IQ and previous years of therapy. A significant difference was indicated for the age variable with the subjects on the block system being older than the subjects on the intermittent system. As would be expected, this difference continued to exist when the grade placement of the two groups was examined.

Table 2 contains a listing of the above stated variables in terms of typological groupings. For the subjects in type 1 as well as for the subjects in type 2, there was no significant difference between subjects on the block system and the intermittent system when the areas of IQ and previous years of therapy were examined. However, the variables of age and grade placement were significantly different with the subjects on the block system being older and in higher grade placements than the subjects on the intermittent system.

Table 1

CHARACTERISTICS OF BLOCK AND INTERMITTENT TOTAL GROUPS
(data in terms of group means)

VARIABLE	BLOCK N = 153	INTERMITTENT N = 243	t Value
AGE	8.0	7.3	4.50**
GRADE PLACEMENT	2.6	2.2	2.81*
IQ	110.3	108.9	NS
PREVIOUS YEARS THERAPY	0.8	0.8	NS

NOTE: NS indicates t value not significant
* indicates t value significant at or beyond 5% level (2 tailed tests)
** indicates t value significant at or beyond 1% level (2 tailed tests)

Table 2

CHARACTERISTICS OF BLOCK AND INTERMITTENT SUBJECTS BY TYPE
(data in terms of group means)

Types	Age	Grade Placement	IQ	Previous Years Therapy
Type 1				
Block (N=11)	9.5	4.4	117.2	1.6
Intermittent (N=52)	7.7	2.5	113.7	1.3
t	3.58**	4.13**	NS	NS
Type 2				
Block (N=34)	8.2	3.1	112.2	1.1
Intermittent (N=73)	7.3	2.3	116.1	0.7
t	2.86**	3.36**	NS	NS
Type 3				
Block (N=79)	8.0	2.6	112.1	0.7
Intermittent (N=80)	7.3	2.0	103.6	0.8
t	2.92**	2.73**	2.95**	NS
Type 4				
Block (N=29)	7.0	1.3	100.4	0.3
Intermittent (N=93)	7.0	1.7	99.8	0.5
t	NS	NS	NS	NS

NOTE: NS indicates t value not significant
* indicates t value significant at or beyond 5% level (2 tailed tests)
** indicates t value significant at or beyond 1% level (2 tailed tests)

The findings for subjects in the type 3 grouping indicated no significant difference in terms of previous years of speech therapy. However, significant differences did exist in the areas of age, grade placement and IQ with the subjects on the block system being older, having a higher grade placement and a higher IQ score. For the subjects in the type 4 grouping there were no significant differences between the block and intermittent group on the variables of age, grade placement, IQ and previous years in therapy.

x^2 tests revealed no significant differences in the proportions of boys to girls when the sex ratio of the subjects under the block system was compared with the sex ratio of the subjects under the intermittent system. This finding holds true for the comparison, not only of the total group but also for the comparison of the sex ratio in each of the four typological groupings. Viewing the total groups, there were 90 boys and 63 girls under the block system and 163 boys and 80 girls under the intermittent system. In the type 1 grouping there were 5 boys and 6 girls under the block system while the intermittent system consisted of 34 boys and 18 girls. The type 2 grouping consisted of 19 boys and 15 girls under the block system and 41 boys and 32 girls under the intermittent system. The type 3 grouping had 48 boys and 31 girls under the block system while the intermittent system had 58 boys and 22 girls. The type 4 grouping consisted of 18 boys and 11 girls under the block system and 30 boys and 8 girls under the intermittent system.

Measuring Instrument

The Illinois Typological Rating Scale utilized in this study evaluates the child's speech difficulties from three perspectives: articulation, hearing acuity, and the presence of organic factors

influencing speech. The following is an analysis of the scoring procedure, and the weights assigned to various areas included in the Illinois Typological Rating Scale:

1. Based on the full scale Templin-Darley Articulation Test, the child received a 0 rating if his score was within the age norms for the test. Any deviation from the age norms received a numerical rating of 1.

2. Using the Templin-Darley test as the measuring instrument each distortion error received a numerical rating of 1, each substitution of a sound a rating of 2, and each omission of a sound a rating of 3.

3. The Barker-England Scale (5), which considers the frequency of occurrence of sounds in determining the proficiency of articulation, was adjusted to provide a scale with a top of 95 rather than 100. This was done since it was felt that the Barker-England Scale included sounds totaling a weight of 5.0 which were not included in the Templin-Darley Scale. The child was then assigned a 0 rating if his adjusted Barker-England score was in the 85 to 95 range, a rating of 1 if the score was in the 75 to 84 range, 2 if it was in the 65 to 74 range, and 3 if it was below 64.

4. The above weights were then computed to provide a total articulation score.

5. Hearing acuity was assigned weights from 0 to 2. If the child indicated a hearing level in the better ear between 0 and 15 db, he received a rating of 0. If the hearing in the better ear was between 15 and 30 db, a rating of 1 was assigned, and if it was below 30 db in the better ear, a rating of 2 was assigned.

6. No evidence of any dental and/or motor deviation received a rating of 0. Any deviation in the above areas was rated as a 1.

7. The rating pertaining to hearing acuity and the rating pertaining to an organic factor were then added to the articulation total score.

8. The total scale score was used to determine typological classification. It should be noted that the higher the scale score, the more severe the speech problem.

9. If the subject indicated a total score of 1 to 9, he was typologically classified as a type 1. A total score between 10 and 18 was classified as a type 2. A type 3 was indicated by a total score between 19 and 39 and a type 4 was any subject who indicated a total typological classification score greater than 39.

A description of the typological classifications might be stated as follows:

Type 1 Slight speech cases. Scoring range, 1-9.

Type 2 Subjects with a moderate degree of severity. Scoring range, 10-18.

Type 3 Subjects of a more severe nature who best might profit from daily speech therapy. Scoring range, 19-39.

Type 4 Very severe articulation problem--will probably best profit from intensive, daily, clinical attention. Scoring range, 40 and above.

The score sheet used in determining the typological classification appears in the appendix.

Working Procedure

The initial responsibilities of all speech correctionists were essentially the same as they had been in previous years. A three week period in September was devoted to speech screening, scheduling, reporting and hearing testing. All speech correctionists began their operational schedules on October 2.

The four speech correctionists working on the intermittent system proceeded in the usual manner and continued their schedules on the intermittent basis throughout the school year. The two speech correctionists on the block system started the first block on October 2. Each block extended for a five week period. While the basic construction of the block was centered on a five week period, holidays were taken into account to allow for an equal number of days in each block. The schools on the block system were each allotted three blocks of time throughout the school year. When the school was not on the scheduled block, they received service one day a week. When

the school was on the scheduled block, they received speech service four days a week for five weeks.

The speech correctionist working under the intermittent system carried a continuous case load of between 75 and 100 speech cases. The speech correctionist working under the block system carried a continuous case load of 30 to 40 speech cases per block and a yearly cumulative case load of between 75 and 100.

Office time and preparation days were allotted between the blocks for the two speech correctionists working on the block system. The speech correctionist on the intermittent system had one-half day per week for such work. The total number of preparation days was equal for both systems each having accumulated thirteen days for the entire school year.

Regardless of the scheduling system used, the individual speech correctionist determined the structure of the speech groups, the length of speech lessons, and the administration of individual or group speech therapy. Consequently, the only experimentally controlled difference between the two systems was that of a concentration of therapy under the block system and a more distributive approach to therapy under the intermittent system.

Method of Statistical Analysis

All data were evaluated by obtaining means for the groups studied and determining the statistical difference between means and mean gains by use of appropriate *t* tests. As is customary, only those values which would occur by chance less than five times out of one-hundred (5% level of confidence) were considered as representing statistically significant differences. In evaluating minutes of

therapy and all pre-scores and post-scores, two tailed *t* tests were used. Since it was predicted that the subjects on the block system would exhibit greater speech gains than the subjects on the intermittent system, one tailed *t* tests were used in evaluating gain scores.

Chapter IV

RESULTS

Results were analyzed both in terms of scores from the Templin-Darley test as well as scores obtained from the Illinois Typological Rating Scale. In all cases the pre, post, and gain scores of children under the block system were contrasted with pre, post, and gain scores of children under the intermittent system. The Templin-Darley score and the scale score (rather than the typological score) of the Illinois Typological Rating Scale both have a relatively wide range. The Templin-Darley scores can range from 0 to 176 while scores on the Illinois Scale can range from 0 to 40. However, inasmuch as this investigation is concerned with typology, the actual typological classifications obtained from the Illinois Scale were also analyzed. This was accomplished by assigning children in the type 1 classification the numerical weight of 1, children in the type 2 classification the numerical weight of 2, with the same procedure being followed in assigning numerical weights to children in the typological classifications of 3 and 4. When a child improved to such an extent that he was dismissed from speech therapy, he was assigned the numerical weight of 0. Hence, if a child no longer manifested speech difficulties and received a 0 as his post scale score obtained from the Illinois Scale, he was also assigned a weight 0 according to typological classification for purposes of statistical analysis.

The typological scores are more gross than the Templin-Darley scores or the scale scores of the Illinois Scale since they only range from 1 to 4. They do, however, emphasize movement from one typological grouping to another.

Besides contrasting results from the Templin-Darley test and the Illinois Scale, the statistical analysis contrasts the average total minutes of therapy each child received during the year under the block system and under the intermittent system.

Table 3 presents data which compare the total group under the block system with the total group under the intermittent system. In examining the area of mean minutes of therapy received during the year, it is noted that the two groups differed significantly at the 1% level of confidence. The subjects under the intermittent system received the greater number of minutes of therapy. It is noted that at the beginning of the study there was a significant difference at the 1% level of confidence in the typological characteristics of the two groups. The children under the block system manifested the more severe type of articulation problem. After therapy the mean typological representation of the two groups was identical, with both groups having a mean post typology score of 1.4. As the table illustrates, the children in the block system exhibited a typological gain of 1.4 while those children in the intermittent system exhibited a typological gain of 1.0. The difference between these gains was significant at the 1% level of confidence. Therefore, the children in the block system indicated a greater typological movement toward improved speech than those children in the intermittent system.

The subjects' pre-scores on the Illinois test differed significantly at the 1% level of confidence When the post-scores of the two groups on the Illinois test were compared, no significant difference was found. However, the subjects in the block system had a higher score on the

Table 3

COMPARISON OF MEAN MINUTES OF THERAPY, PRE-SCORE AND POST-SCORE MEANS, AND MEAN GAINS FOR TOTAL BLOCK SUBJECTS VERSUS TOTAL INTERMITTENT SUBJECTS

	MINUTES OF THERAPY	ILLINOIS TEST						TEMPLIN-DARLEY		
		Pre-Type	Post-Type	Gain	Pre-Score	Post-Score	Gain	Pre-Score	Post-Score	Gain
Block (N = 153)	639.8	2.8	1.4	1.4	29.5	9.2	20.3	114.7	156.6	41.9
Intermittent (N = 243)	806.3	2.4	1.4	1.0	23.5	10.8	12.7	124.7	150.7	26.0
t	5.98**	13.00**	NS	5.00**	3.17**	NS	6.36**	3.26**	2.36**	7.53**

NOTE: NS indicates t value not significant
* indicates t value significant at or beyond 5% level
** indicates t value significant at or beyond 1% level

pre-test indicating the more severe articulation problem. Hence, when the gains made by the two groups were compared the difference was significant at the 1% level of confidence. The children in the block system made the greater gain and thus indicated a greater degree of improvement in speech than did the children in the intermittent system.

When the two groups were contrasted in terms of their Templin-Darley scores, significant differences at the 1% level of confidence were found on pre-test, post-test and gain scores. At the beginning of the study the subjects in the block system had a significantly lower score than the intermittent subjects. This would indicate the subjects on the block system had the more severe articulation problem since the lower the score on the Templin-Darley test, the greater the number of articulation errors. A reversal in this pattern was evidenced at the completion of the study when the subjects on the intermittent system had the lower Templin-Darley scores.

The gain scores indicate that the subjects on the block system showed greater improvement in speech than did those on the intermittent system. The children receiving therapy under the block system had the more severe articulation problem at the beginning of the study but had the less severe articulation problem at the completion of the study.

These results confirm the hypothesis that children with articulation problems receiving speech correction under the block system of scheduling make significantly greater gains in speech than a contrast group of children receiving speech correction under the intermittent system of scheduling.

Table 4 contrasts results for the individual typological classifications under the block and the intermittent systems. In examining the area of mean total minutes of therapy received during the year it

Table 4

COMPARISON OF MEAN MINUTES OF THERAPY, PRE-SCORE AND POST-SCORE MEANS AND MEAN GAINS FOR INDIVIDUAL TYPOLOGICAL GROUPINGS

	MINUTES OF THERAPY	ILLINOIS TEST						TEMPLIN-DARLEY		
		Pre-Type	Post-Type	Gain	Pre-Score	Post-Score	Gain	Pre-Score	Post-Score	Gain
Type 1										
Block (N=31)	464.1	1.0	0.7	0.3	7.3	2.7	4.6	152.3	171.2	18.9
Intermittent (N=52)	794.3	1.0	0.7	0.3	5.6	2.7	2.9	146.6	165.1	18.5
t	3.67**	NS	NS	NS	NS	NS	NS	NS	NS	NS
Type 2										
Block (N=34)	535.3	2.0	1.0	1.0	14.7	4.5	10.2	137.9	169.6	31.7
Intermittent (N=73)	833.3	2.0	1.1	0.9	14.4	6.1	8.3	133.6	158.4	24.8
t	5.30**	NS	NS	NS	NS	NS	NS	NS	2.22*	NS
Type 3										
Block (N=77)	660.8	3.0	1.3	1.7	28.2	6.4	21.8	114.2	162.5	48.3
Intermittent (N=80)	762.9	3.0	1.6	1.4	27.7	11.5	16.2	120.1	149.9	29.8
t	2.38*	NS	1.98*	2.90**	NS	2.50*	2.99**	NS	3.27**	6.00**
Type 4										
Block (N=29)	772.1	4.0	2.4	1.6	58.8	24.6	34.2	74.8	119.9	45.1
Intermittent (N=18)	862.4	4.0	2.8	1.2	56.5	29.4	27.1	87.6	118.0	30.4
t	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

NOTE: NS indicates t value not significant
* indicates t value significant at or beyond 5% level
** indicates t value significant at or beyond 1% level

is noted that the children under the intermittent system received more minutes of speech therapy than did those under the block system. While this was not significantly different for the children in the type 4 classification, it was significant at the 1% level of confidence for the children in the type 1 and type 2 classifications. The children in the type 3 grouping on the intermittent system also received more minutes of speech therapy than the children on the block system. This was significant at the 5% level of confidence.

Following the same procedure previously described on page 23, numerical weights of 1, 2, 3, and 4 were assigned to children in each classification for the purpose of statistically analyzing movement from one classification to another after therapy.

By definition both groups indicated equal pre-type scores within the individual typological classification. When comparing post-type scores and the gain in type scores for the intermittent and the block subjects, no significant differences were found in either category for types 1, 2, and 4. However, the type 3 classification indicated a difference in the post-type scores which was significant at the 5% level of confidence. The children under the block system had a post-type score of 1.3 while the post-type score for children under the intermittent system was 1.6. The gain in type scores was also found to be significant at the 1% level of confidence for subjects in the type 3 grouping. Children in the block system had an average gain of 1.7 while those in the intermittent system showed an average gain of 1.4. While the intermittent group and the block group both started with an equal 3.0 type score, the children in the block group made greater gains and consequently manifested a post-type score indicating

less severe speech problems than those on the intermittent system. This same comparison of post-scores and gain scores for the type 3 children in the block system as contrasted with children in the intermittent system holds true upon examination of the scale scores of the Illinois Scale.

When the individual typological groupings are examined with respect to the Templin-Darley scores, no significant differences were found on the pre-score, post-score or gain scores for the children classified as type 1 and 4 under the two different systems. While the type 2 classification indicates no significant differences on the Templin-Darley pre-scores and gain scores, the post-scores were found to be significantly different at the 5% level of confidence. The children on the block system who were classified as type 2 started therapy as less severe cases than type 2 children under the intermittent system and they maintained this difference through speech therapy. While their mean pre-score on the Templin-Darley was only 4.3 points better than the score of the intermittent group, their mean post-score on the Templin-Darley was 11.2 points better than the score of the intermittent group. This difference between the post-scores of the two groups reached statistical significance at the 5% level of confidence. When the children in the type 3 classification were considered, it was found that there was no significant difference between the block system group and the intermittent system group on pre-scores on the Templin-Darley Articulation Test. However, the post-scores indicated a significant difference at the 1% level of confidence. Though the children on the block system started speech therapy with lower Templin-Darley scores, indicating a more severe articulation problem,

they had significantly higher post-scores indicating a less severe articulation problem at the end of the school year. The gains made by the block group when compared to the intermittent group were significantly different at the 1% level of confidence. This indicates that the children on the block system made significantly greater gains in articulation than did those on the intermittent system.

Hence, the results depicted in Table 4 give partial support to the hypothesis that when articulation problems are viewed in terms of four severity groupings, children receiving speech correction under the block system make significantly greater gains in speech in each of the four groupings than children receiving speech correction under the intermittent system of scheduling.

Chapter V

DISCUSSION

Discussion of Results Relating to Speech Progress

The basic purpose of this study was to investigate the effectiveness of the block system approach to scheduling children for speech correction services in the public schools as contrasted with the intermittent system. The literature pertaining to varying approaches used in scheduling speech cases in the public schools has seemed primarily directed toward a comparison of the dismissal rates under particular systems. It is agreed that dismissal from speech therapy is a major goal of the therapist and the client, however, for purposes of comparison it was felt that more information would be gained by classifying the subjects in terms of severity prior to therapy and following therapy. Therefore, emphasis was directed at determining the type of problems with which the speech correctionist was working and the progress made within the various severity groupings.

The hypothesis that children with articulation problems receiving speech correction under the block system of scheduling make significantly greater gains in speech than a contrast group of children receiving speech correction under the intermittent system of scheduling was supported by the data. However, there were some significant differences in the characteristics of the two groups of subjects. One may well wonder, then, if the greater gains made by children under the block system could be attributable to these differences in the characteristics of the subjects rather than being attributable to the fact that the group received speech therapy under two different systems of scheduling. When the total block and intermittent groups were contrasted, the variables of IQ and previous years of therapy showed no significant

differences. However, there was a statistically significant difference between the two groups on the variables of age and grade placement. Children under the block system were older and in a higher grade placement than the children under the intermittent system. An initial reaction to this information would seem to be the assumption that the older children would be more susceptible to speech gains. However, it is felt that the age variable should be further scrutinized in terms of its relationship to speech therapy.

There appears to be a common area of disagreement between the advocates of early speech therapy and what we might term maturationalists. The former advocate speech therapy for the younger children in an attempt to enhance speech development and to limit the possibility of defective sounds or undeveloped sounds becoming a poor speech habit. The maturationalists do not advocate providing speech therapy for children until they have reached the maturational level where all speech sounds should be developed. However, differences between the advocates of early speech therapy and the maturationalists are minimized when it is noted that both groups are in essence saying that the younger the child, the greater the probability for speech gains. The difference lies only in the approach to the young speech defective child. The advocates of early speech therapy believe in working with the younger speech defective child even if the speech problem may be alleviated by maturation in some instances. The maturationalists, on the other hand, believe in giving speech therapy only after maturation can be assumed to have occurred. Hence, they feel that they are then giving services to the child with a definite speech defect. At any rate, both schools of thought agree that the older the speech defective child,

the more difficult the task in accomplishing gains in the improvement of speech.

If the postulation that the longer the habit is practiced the more difficult it is to break the habit is accepted, then it must follow that the longer the child practices the incorrect production of speech sounds the more difficult will be the task to teach the correct production of the sounds. Therefore, the significance of the age difference noted between the two groups would be in favor of the intermittent system rather than the block system. Following this theoretical approach, then, the mean age of the children on the block system was to their disadvantage.

When the two total groups were compared on the basis of the total mean minutes of therapy which each child received, it is interesting to note that the children on the block system received fewer minutes of speech therapy than did the children on the intermittent system. Yet the scaled scores and the type scores from the Illinois Scale as well as scores from the Templin-Darley test indicated that children under the block system made significantly more progress in speech than did the children under the intermittent system. The scores indicate that while children on the block system manifested the more severe speech problems at the beginning of the study, their speech problems were less severe than those of the children on the intermittent system at the end of the study. These group gains were accomplished while each child on the block system was receiving on the average of 166.6 less minutes of speech therapy for the year. This information would seem to lend strong support to the viewpoint that speech therapy administered under the block system is more effective and more efficient

than speech therapy administered under the intermittent system. The greater effectiveness of the block system seems to be supported by the fact that the children under this system evidenced more progress in speech than did the children under the intermittent system. Since this progress was accomplished with less minutes of therapy administered under the block system, greater efficiency would seem to be associated with this approach to scheduling. Then, too, each individual speech correctionist saw the same total number of children during the academic year whether he was working under the block or the intermittent system. It, therefore, seems that the results support the conclusion that the block system represents a more efficient use of the speech correctionist's skills and time since under this system more effective results occur in speech progress while fewer minutes of time are devoted to the speech therapy of each child.

The data of this investigation gave partial support to the hypothesis that when articulation problems are viewed in terms of four severity groupings, children receiving speech correction under the block system make significantly greater gains in speech in each of the four groupings than children receiving speech correction under the intermittent system of scheduling. In all typological groupings, children under the block system indicated greater gains in speech improvement as defined by all the measuring instruments. However, these differences were not statistically significant in all cases. No significant differences between results occurred within the type 1 and the type 4 groupings. In the type 2 grouping the only significant difference occurred in the area of the post-Templin-Darley scores where children under the block manifested the higher score, indicating better

speech. In view of the fact, however, that the children in the block system had somewhat higher Templin-Darley scores at the beginning of the study and in view of the fact that the difference in the gain scores of the two groups on this instrument was not statistically significant, the value of these results is questionable.

The most outstanding results occurred within the type 3 classification. Here, the children under the block system made significantly greater improvement on all instruments than did the children under the intermittent system. They showed greater movement in terms of typological improvement as well as greater improvement as measured by the scale scores of the Illinois Scale and the scores of the Templin-Darley test. In evaluating these results, it should be remembered that subjects in the type 3 grouping showed significant differences on the variables of age, grade placement, and IQ. The fact that the children on the block system were older and in a higher grade placement than the children in the intermittent system would not seem to have adverse implications for the results. As discussed previously when one holds the viewpoint that speech therapy is more difficult with older speech defective children than with younger children, the greater movement in speech progress by children in the block system appears to be even more significant.

The fact that children in the block system possessed the higher IQ in the type 3 grouping poses some limitations upon the interpretation of the finding that they also evidenced greater improvement in speech. Yet, it should be noted that the IQ scores were based upon group tests and that the difference between the two groups was only 8.5 points. The actual significance of this difference is questionable in view of

the difficulties of reliability inherent in group IQ measures. Then, too, assuming that the 8.5 point difference represents a reliable difference in the IQ's of the two groups. it seems doubtful that a very significant degree of improvement in speech can really be attributed to a difference of 8.5 IQ points.

It is noted that in all the typological classifications children in the block system had fewer minutes of speech therapy than children under the intermittent system. In the type 3 grouping, children under the block approach had an average of 102.1 less minutes of speech therapy. If the higher IQ of children under the block could be assumed to be a significant factor contributing to their greater degree of improvement, one wonders if the fact that they had less time in speech therapy could not be viewed as a factor counterbalancing the effect of higher IQ on speech progress results.

In viewing the total results of the study, it is highly encouraging to note that in all instances the children under the block system evidenced the greater degree of speech progress. It is of further encouragement to note that the instances where the degree of progress of the block subjects was significantly greater than the degree of progress of the intermittent subjects occured in those areas where there was a rather large number of subjects under the block system. In the types 1, 2, and 4 classifications the number of subjects on the block were only 11, 34, and 20 respectively as compared with numbers of 52, 73, and 38 on the intermittent system. However the number of children under the block system was relatively larger for the type 3 grouping, with the intermittent group's 80 subjects

being matched by 79 subjects on the block. A reasonable conjecture is that perhaps had there been a larger number of subjects in the block for type groupings 1, 2, and 4, more of the results related to speech progress would have reached statistical significance. Then, too, perhaps if the study had continued for more than one year, there would have been a larger difference between the gains of the subjects on the block and the intermittent system. At any rate, the hypothesis that when articulation problems are viewed in terms of four severity groupings, children receiving speech correction under the block system make significantly greater gains in speech in each of the four groupings than children receiving speech correction under the intermittent system of scheduling was supported by the data even though it received only partial support in terms of statistical significance of results.

The results of this investigation point to a number of implications. The only variable which was experimentally manipulated was the variable of the scheduling of speech therapy according to either the intermittent or the block system. In all cases children under the block system evidenced greater gains in speech progress. The greater gain in speech progress by the children under the block system is likely attributable to factors other than those directly stemming merely from the difference in scheduling. Nevertheless, it was the contention of this study that such differences would arise and operate more favorably under the block system in that this system of scheduling allows these differences better opportunity to operate than does the intermittent system. For example, a factor which probably contributes significantly to results is that of individual and group therapy. One may wonder whether the

results of this research are not attributable to differences in this factor rather than to differences in scheduling. Examination of the data strongly implies that if this factor is considered, it is the scheduling difference that allows this factor to operate more advantageously for better results under the block system than under the intermittent system. To illustrate, the data showed that of the 153 subjects on the block system, 48 (31%) received an average of about 439 minutes of individual speech therapy each. Of the 243 children on the intermittent system, only 32 (13%) received individual therapy but each of these 32 children received an average of 616 minutes of individual speech therapy. This information seems to imply that under the block system the factor of individual and group therapy operates more efficiently and more effectively. This is not to say, however, that the value of individual and/or group therapy is not an area worthy of further investigation.

Since the hypothesis that articulation problems indicate greater improvement if speech therapy is administered through a block system approach to scheduling was supported by the data, this study concludes that the block system appears to offer a more effective and efficient use of the speech correctionist's time and skills than does the intermittent system. By manipulating the experimental variable of scheduling, many other factors related to speech therapy and progress changed and varied in their operation. A speech correctionist working under the block system had a smaller case load at any one particular time and for certain concentrated periods of time he was able to see each child more frequently than he would if the intermittent system were in operation. No doubt these factors played a significant role in the

greater gains in improvement in speech with children under the block system. Further research could investigate the degree to which each of these factors was associated with more positive results.

It seems likely that a number of factors not directly attributable to the scheduling difference operated more favorably under the block system. For example, the theoretical conjecture of this investigation holds that under the block system the speech correctionist would have more motivation and enthusiasm for his work and that the child would be more cognizant of the value of speech. It is possible that these factors contributed to the greater degree of progress evidenced by the block system. However, it remains for further investigations to definitely determine how these factors may have been associated with the results.

All in all, then, this investigation would seem to suggest a reappraisal of the present demands placed upon the public school speech correctionist. This reappraisal should not only consider the goals of speech therapy but also the procedures by which these goals may be more realistically attained. Until there is a body of research pointing to the contrary, many speech correctionists will continue to believe that the emphasis placed upon the number of children to be served greatly limits the quality of service they can provide for these children.

Discussion of Principal and Classroom Teacher Evaluation of the Block System

When discussing this investigation with experienced public school speech correctionists, some concern was expressed relative to the reactions of teachers and principals to the initiation of a block system. These reactions were felt to be of particular concern in those instances where school personnel were accustomed to an

intermittent system of scheduling children for speech. Since this was felt to be a potentially major problem, a questionnaire was presented to the principals and teachers in the schools under the block system. The questionnaire was designed to be brief and was completed at the end of the school year. The questionnaire was also designed to determine if the teacher had experience with both the block system and the intermittent system of scheduling speech cases. Teachers and principals were then asked to express a preference for either the block or the intermittent system. Space was allotted on the questionnaire for the teacher to make comments, if she so desired.

Table 5 presents the results of the questionnaire as completed by the principals in the schools where the block system was scheduled. All six school principals had experience with both the intermittent system and the block system and all six stated they preferred the block system approach to speech therapy. All principals made complimentary statements concerning the block system, delineating specific reasons for their preference. The comments were of particular interest since they ranged from statements concerning ease of scheduling and working relationships between the speech correctionist and the school faculty to statements concerning motivation and learning theory.

Table 5

RESULTS FROM PRINCIPAL QUESTIONNAIRE

Level	Number	Experience on Both	Prefer Block	Prefer Intermittent	No Preference	Experience on Block Only
Elem.	4	4	4	0	0	0
Elem. and Jr. High	2	2	2	0	0	0
Total	6	6	6	0	0	0

Table 6 presents the results of the questionnaire as completed by the teachers in the schools where the block system was scheduled. The total of fifty-seven teachers represents the total number of teachers who had children receiving speech services under the block system. Seventeen of the fifty-seven teachers had experience only with the block system. Though they did respond favorably to the block system, their responses were not included since it was felt they did not have adequate basis for comparison of the two systems.

As illustrated in Table 6, thirty-four of the forty teachers who had had experience with both systems of scheduling speech cases preferred the block system to the intermittent system. Two teachers who had had experience under both systems stated they had no preference for either. Four of the forty teachers who had had experience under both systems stated they preferred the intermittent system. Though statistical significance was not computed for teacher preference, it was felt that the results of the questionnaire should be included.

The comments made by teachers who had had experience under both systems of scheduling are of interest. Of the thirty-four teachers who preferred the block to the intermittent system, only one did not make any comment. The remaining thirty-three presented comments which ranged from ease of scheduling to greater speech benefits being obtained under the block system.

One of the four teachers who had had experience with both systems of scheduling preferred the intermittent system but did not comment. Two of the remaining three teachers felt that the block system disrupted class more than did the intermittent system. The third teacher that felt greater speech gains were obtained under the block system

Table 6

RESULTS OF TEACHER QUESTIONNAIRE

Grade	Number	Experience on Both	Prefer the Block	Prefer the Intermittent	No Preference	Experience on Block Only
K	1	0	0	0	0	1
1	13	10	9	1	0	3
2	10	6	4	1	1	4
3	10	6	4	1	1	4
4	9	9	9	0	0	0
5	8	6	5	1	0	2
6	4	2	2	0	0	2
Sp. Educ.	1	0	0	0	0	1
EMH	1	1	1	0	0	0
TOTALS	57	40	34	4	2	17

still preferred the intermittent system because she felt it did not disrupt class as much as did the block system.

In reviewing the comments made by teachers who had experience under both methods of scheduling children for speech services, it is interesting to note that while some felt that one system was more disrupting to the classroom schedule, an even greater number thought it was less disrupting. Most of the teachers who preferred the block system and even one who preferred the intermittent system stated that greater motivation and/or greater speech gains seemed to be apparent under the block system. While a negative teacher reaction to the block system might be evidenced in some schools or school systems, it was not evidenced in this study. To the contrary, teachers exhibited appreciation of the change in scheduling procedures and cooperated fully in the implementation of this change.

Implications for Further Research

This investigation was basically concerned with an evaluation of the effectiveness of two systems of scheduling children for speech therapy in the public schools. The results of this investigation indicate a need for further research in the following areas:

- An evaluation of the effectiveness of individual speech therapy, group speech therapy and individual combined with group speech therapy when administered under a block system as contrasted with an intermittent system of scheduling.
- An investigation of the incidence of speech substitutions, distortions, and omissions and the rate of speech progress for each classification when speech therapy is administered under the block system as contrasted with an intermittent system of scheduling.

- An investigation of the children in the type 1 classification in terms of speech gains realised through speech improvement with large groups.
- An investigation of the children in the type 1 classification in terms of improvement in speech without the administration of speech therapy or speech improvement classes.
- An investigation of speech progress exhibited by three major IQ groupings (above average, average and below average) when speech therapy is administered under a block system as contrasted with an intermittent system of scheduling.
- An investigation of the rate of speech progress and total speech gains when children receive speech therapy on a consistent daily schedule, a block system schedule, and an intermittent system schedule.
- An investigation of the relationship between the typological groupings and IQ and school achievement.
- An investigation of the block system and the intermittent system of scheduling speech therapy while individually matching the subjects in each system.

Chapter VII

SUMMARY

Problem and Hypotheses

The general problem of this study was to investigate the effectiveness of two methods of scheduling speech correction cases, the block system versus the intermittent system. Specifically, it was hypothesized that children with articulation problems receiving speech correction under the block system of scheduling make significantly greater gains in speech than a contrast group of children receiving speech correction under the intermittent system of scheduling. It was further hypothesized that when articulation problems are viewed in terms of four severity groupings, children receiving speech correction under the block system make significantly greater gains in speech in each of the four groupings than children receiving speech correction under the intermittent system of scheduling.

Selection of Subjects

The experimental group was selected from a school population of 2,700 children enrolled in five of the eighteen elementary schools. These five schools were serviced by two speech correctionists using the block system. The contrast group was selected from a school population of 3,400 children enrolled in the remaining thirteen elementary schools. These thirteen schools were serviced by four speech correctionists using the intermittent system. In both the experimental and contrast groups there were approximately comparable proportions of rural, negro, and upper, middle and lower class white children.

General Procedure for Gathering Data

All children scheduled for speech correction services who exhibited articulation difficulties on screening tests were administered a full scale Templin-Darley Articulation Test prior to receiving speech therapy. Children who presented vocal or rhythmical speech problems or who were in special orthopedic classes or classes for the mentally handicapped were not included as subjects for this study. The results of the screening process, then, provided an N of 153 subjects on the block system and 243 subjects on the intermittent system. Additional information was gathered in regard to group IQ scores, grade placement, age, sex, and previous years of speech therapy. At the end of the school year and/or at the time of dismissal from speech therapy, all children who were receiving speech services were again administered a full scale Templin-Darley Articulation Test. Following a typological rating system developed at the University of Illinois, children were assigned to one of four classifications indicating severity of articulation problem. The type 1 classification represented the least severe speech problem while the type 4 classification represented the most severe speech problem.

Characteristics of Subjects

The characteristics of the subjects were examined in terms of age, grade placement, IQ, previous years of therapy, and sex. In general, subjects on the block system were older and in higher grade placements than subjects on the intermittent system. There were no significant differences between the groups in terms of previous years of therapy. There was a significant difference between the two groups in terms of IQ only for the type 3 grouping with subjects in the block system having

the higher IQ. χ^2 tests revealed no significant differences in the proportion of boys to girls when the sex ratio of the subjects under the block system was compared with the sex ratio of the subjects under the intermittent system.

Measuring Instruments

Pre and post full scale Templin-Darley Articulation Tests were administered to both experimental and control subjects. Results on the Templin-Darley tests were used in determining an adjusted Barker-England Score. The adjusted Barker-England Score, based on the frequency of occurrence of sounds, provided an articulation proficiency score. Numerical weights were assigned to substitutions, omissions and distortions of sounds. Norms on the Templin-Darley test, adjusted Barker-England Scores, and the numerical weights for sound substitutions, omissions and distortions were then totaled to provide the articulation score. The total articulation score was added to numerical weights allotted for hearing acuity and organic involvement to determine a final severity typological rating. The instrument used to determine severity types was the Illinois Typological Rating Scale.

Working Procedure

The schools on the block system were each allotted three blocks of time throughout the school year. Each block extended for a five week period. When the school was on the scheduled block, speech services were provided four days a week for the five week period. When the school was not on the scheduled block, speech services were provided one day per week. Hence, while the school was on the block, a child receiving speech services under the block system would normally see the speech correctionist each day for four days per week. When

the school was not on the block, the child might see the speech correctionist one day per week according to the judgment of the speech correctionist regarding the child's need for speech services. The speech correctionist working under the intermittent system would normally see each child twice a week until the end of the school year and/or until the time of dismissal from speech.

Under the block system the speech correctionist had a continuous case load of from 35 to 40 cases per week for each five week block. His cumulative yearly case load was between 80 and 100. Under the intermittent system, the speech correctionist had a continuous case load of 80 to 100 cases per week while his cumulative yearly case load was between 80 and 100.

Method of Statistical Analysis

Data were evaluated by comparing group means using appropriate t tests and accepting the 5% level of confidence as representing statistically significant differences.

Results

When the total group on the block system was contrasted with the total group on the intermittent system, the speech gains evidenced by the children on the block system were consistently and significantly greater than those evidenced by the children on the intermittent system (5% and 1% level of confidence). This was felt to be of considerable importance since the average minutes of speech therapy received for the school year was less for the children on the block system than for the children on the intermittent system. The difference in the minutes of speech therapy received was significant at the 1% level of confidence.

When the children under the two systems were contrasted as individual severity groupings, the difference in speech gains between the two systems of scheduling reached statistical significance mainly for the type 3 grouping. Although statistical significance was not reached for the type 1, 2, and 4 severity groupings, the children within these groupings on the block system evidenced consistently greater speech gains than did the children in the same groupings on the intermittent system.

The hypothesis that children with articulation problems receiving speech correction under the block system of scheduling make significantly greater gains in speech than a contrast group of children receiving speech correction under the intermittent system of scheduling received strong support from the data.

The hypothesis that when articulation problems are viewed in terms of four severity groupings, children receiving speech correction under the block system make significantly greater gains in speech in each of the four groupings than children receiving speech correction under the intermittent system of scheduling also received support from the data even though it received only partial support in terms of statistical significance of results.

REFERENCES

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(4) O'Neill, John J. "Do We Have an Adequate Diagnostic Approach" Paper presented at the 1961 convention of the American Speech and Hearing Association in Chicago.

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APPENDIX

Score Sheet Used To Determine Typological Classification

AREAS CONSIDERED	METHOD OF SCORING	POINTS
ARTICULATION		
a. Templin-Darley Total Score	within age norms = 0 deviation from age norms = 1	_____
b. Distortions revealed on Templin-Darley	1 point each Errors _____	_____
c. Substitutions revealed on Templin-Darley	2 points each Errors _____	_____
d. Omissions revealed on Templin-Darley	3 points each Errors _____	_____
e. Barker Weighted Scores (Adjusted)	95-85 = 0 84-75 = 1 74-65 = 2 64- = 3 Score _____	_____
HEARING ACUITY FOR BETTER EAR	0-15 db = 0 15-30 db = 1 below 30 db = 2 Hearing Level _____	_____
ORGANIC	No dental and/or motor deviation = 0 Dental and/or motor deviation = 1	_____

TOTAL SCALE SCORE _____

TYPE _____

Type 1 = score range 0-9
Type 2 = score range 10-18
Type 3 = score range 19-39
Type 4 = score range 40----